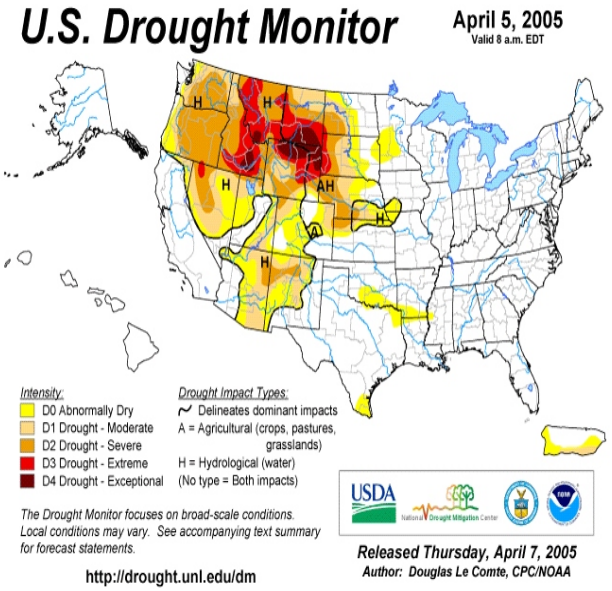
Northern Rockies Weather Watch
NWS Missoula, Montana Spring 2005

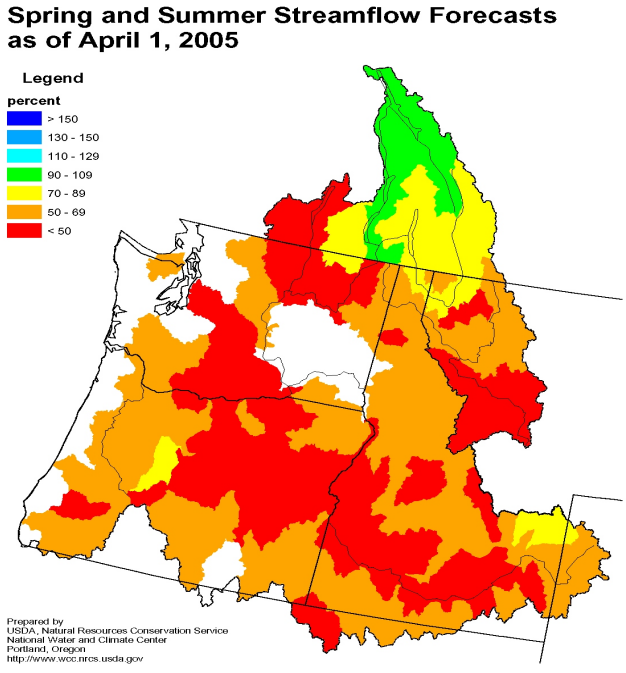
DROUGHT WORSENS ACROSS MONTANA AND IDAHO

Mainstem Rivers and Streams

Due to a lack of snowpack across Montana and Idaho the drought situation has gone from bad to worse (Figure 1). Snowpack accumulation for the 2004-2005 winter remains at or near record low amounts across much of Montana and Idaho. Many of the snowpack monitoring sites operated by the Natural Resource Conservation Service have set new record low values. The Upper Clark Fork, Lower Clark Fork, Bitterroot, Flathead and Clearwater River basins are currently at or tied for the lowest snowpack on record(snowpack record comparisons go back to the 1960's). Water supply shortages are anticipated for the summer of 2005 in those areas relying on surface water supply for domestic and agricultural needs. Below is a chart indicating the snow water equivalent (percent of Average as of April 7, 2005)



SNOW WATER EQUIVALENT % OF NORMAL	STATE (RIVER BASIN) MONTANA	IDAHO
64	Kootenai	
62	Flathead	
57	Upper Clark Fork	
55	Bitterroot	
53	Lower Clark Fork	
56		Clearwater
62		Salmon



Streamflow forecasts for the April through September period are well below normal levels due to the below normal snowpack (Figure 2). Streamflow levels in the 50 to 70 percent of normal range are forecast. The Flathead river Basin forecast is 60-70 percent of normal, while the Bitterroot and Clarkfork River Basins are forecast to flow at 50 % or less of normal. In Idaho the Clearwater and Salmon River Basin is expected to flow at 50-70 percent of average.

Long Term Drought Continues - Weather Stats October through March of 2004-2005

The first half of the water year from October 2004-March2005 was generally dry and warm.

The brief relief from long term drought in Western Montana last August and September ended up to be just that, short term relief. The wet spell that occurred in August and September lasted in Northwest Montana through the end of October. The winter months were exceptionally dry, mainly from November through mid March.
In fact, during the past 6 month period of October through March, not one location reported above normal precipitation in Western Montana or Central Idaho. Six month averages ranged from 38 percent of normal in Shoup, Idaho to 83 percent of normal in Eureka, Montana.
Conditions could have been much worse in Northwest Montana, but the single month of October proved to be a period of above normal precipitation by 110% to 150% in Northwest Montana. Also, the second half of March produced near to slightly above normal precipitation which helped the entire region's percentage of normal precipitation upwards around 5 to 10 percent.
With the exception of one cold arctic outbreak the end of December through the first week of January, temperatures remained at or above normal most of the winter. This arctic outbreak kept many places from breaking warm temperature records for the winter. Temperatures ended up being above normal at all locations for the 6 month period. The period from mid January to early February was the warmest on record at many locations. In addition, Kalispell recorded its driest and warmest February on record.

What's the Cause?

The reasons for the dry mild winter are complex. One important factor was the warmer then average water temperatures in equatorial regions in the central Pacific Ocean. These warm water temperatures were partly a result of a weak El Nino, but occurred farther west in the Pacific then would typically occur in a normal El Nino. The warmer ocean temperatures can lead to more thunderstorm activity then normal. Recent studies have shown that an increase in thunderstorm activity in the equatorial central Pacific Ocean often leads to the development of high pressure over the Northwest United States, and low pressure over the Southwest United States during the winter. This provides warm dry conditions to our area, and wet conditions over the Southwest. This is generally what happened this winter, with record low snowpack from Montana into Washington and Oregon, and one of the wettest winters on record from central and southern California into southern Utah and Arizona.
The table on the next page shows the actual precipitation and percent of normal for October 1st through March 31st.
Note: Years over which the Record Rank is determined varies from station to station. The earliest year with data is listed next to the rank.

January 2005 Was Full of Weather Extremes!

Starting cold, Ending warm and dry

January 2005 started out cold and snowy, followed by record warm and dry conditions at the end of the month. Southwest Montana experienced the warmest temperatures for the month, with the Butte Mooney Airport reporting temperatures four degrees above the January normal. Butte recorded the warmest period of record from January 17 to 28, with temperatures nineteen degrees above the average through this period. Butte also experienced six days of 50 degrees or higher, breaking records on five days.

Heavy Snow/Ice Storm event, January 12 to 18

The most significant event to occur this past winter was over a 6 day in January of 2005. An arctic front brought blizzard conditions and emergency travel on many roads western Montana roads on January 12th and 13th. That event was followed by an ice storm in northwest Montana on January 18. Moisture from an approaching warm front began to spread over the dome of cold air trapped in the valleys. Over a quarter of an inch of freezing rain fell in Northwest valleys, causing numerous road accidents and widespread emergency travel only. The Glacier International Airport was closed for almost 12 hours. The next day, the combination of warmer temperatures and rain caused minor flooding to occur from an ice jam break on Grave Creek near Fortine.

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October 1st, 2004 – March 31st, 2005 Precipitation Statistics

Site	30 Year Normal	Actual	Percent of Normal	Record Rank
Montana:				
Missoula	5.73	3.07	54%	4th - 1893
Butte	3.75	1.80	48%	5th - 1894
Kalispell	7.79	5.34	69%	12th - 1899
Darby	7.58	3.51	46%	2nd - 1948
Drummond	4.48	2.51	56%	6th - 1928
Thompson Falls1	3.48	7.30	54%	3rd - 1911
Heron	21.58	16.4	76%	11th - 1912
Libby	14.71	7.94	54%	11th - 1895
Eureka	6.11	5.33	83%	17th - 1960
Olney	11.8	7.78	66%	2nd - 1962
Anaconda	4.39	3.35	86%	12th - 1905
Sula	6.07	2.34	39%	Driest - 1955
Idaho:				
Elk City	16.95	10.51	62%	4th - 1914
Grangeville	10.21	6.15	60%	3rd - 1893
Orofino	15.66	11.11	71%	4th - 1903
Pierce	27.02	20.13	75%	7th - 1913
Powell	25.16	15.38	61%	3rd - 1962
Salmon	3.87	1.86	48%	4th - 1905
Shoup	7.09	2.71	38%	2nd - 1966

October 1st, 2004 – March 31st, 2005 Temperature Statistics

Average Maximum Temperatures…Actual versus Period of Record

Site	Actual	Period of Record	Departure	Record Rank
Butte	42.7	38.9	+3.8 Degrees	3rd - 1941
Missoula	42.8	40.8	+2.0 Degrees	15th - 1948
Kalispell	41.3	39.0	+2.3 Degrees	4th - 1948

What is the potential for an active fire season this summer?

Not surprisingly, after one of the driest winters on record in the northern Rockies, fire fuel conditions are drier then average for this time of year. This is compounded by the poor health of forests and rangeland after 6 years of general drought conditions.

Grass Fire on Mount Sentinel in Missoula - August 1999

The current dry conditions have certainly increased the potential for an active fire season, but this is no guarantee of widespread fire activity this summer. This will depend how much spring rain we receive through June, how hot and dry the summer is, and how many lightning strikes occur during the summer. The current long range forecast for the remainder of the spring and summer is for equal chances of warm vs. cool, and wet vs. dry.

Looking back at the severe fires seasons in the last century, the summers during these active fire seasons were all hotter and drier then normal. So a hot dry summer is the real key. During some of these years, the preceding winters were dry, but in others the winters had normal precipitation. Another factor that does seem to be important for a severe fire season, is the average temperature in the preceding winter and spring of the severe fire seasons were warmer then average. This winter was quite warm, however temperatures since mid-March have been near normal.

Most of the driest winters in our area were not followed by active fire seasons. In many cases, the summers following these dry winters were cool and wet. This in part can be explained by El Nino. During the winter, El Nino often bring dry warm weather. If the El Nino continues into the summer, cool wet weather often occurs. This year, we had a very weak El Nino this winter, but do not expect El Nino this summer.

The potential for active fire season this summer does exist given the current dry conditions, but there are still many factors that could reduce the threat between now and this summer.✪

Upcoming Spotter Sessions:

Due to staffing shortages, we will have less training sessions this spring. However, the in person spotter presentation that we do, is also available on-line at the following address:
http://www.wrh.noaa.gov/mso/train/STrain.html
Here is a list of upcoming spotter dates/locations.
Missoula: May 18th, 7:30 pm @2147 Ernest
Kalispell: May 19th, 7:30 pm @United Way conference center in the Gateway West Mall.
Grangeville: May 25th, 7:00 pm@Super 8 Motel
Kalispell: June 21st, Location and time yet to be determined
Hamilton: June 29th, Location and time yet to be determined.

As always, post cards will be sent to all spotters when classes will be offered in your location inviting/reminding you of the location and time of each session about one week prior to the class. Stay tuned to our website for more dates/locations.
http://www.wrh.noaa.gov/mso